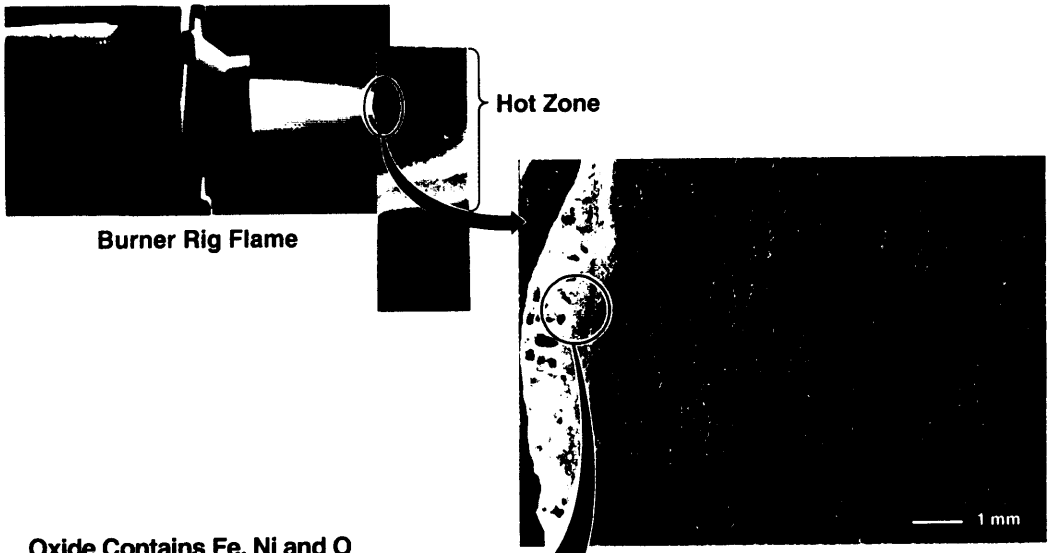
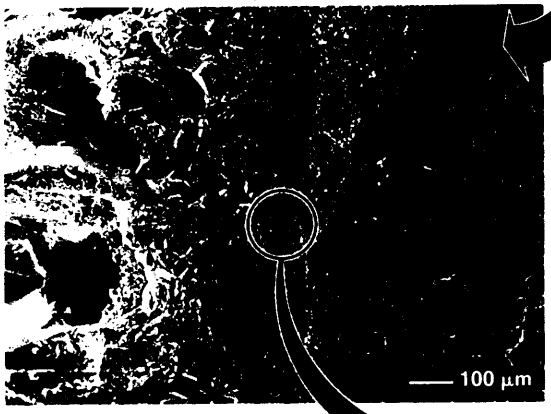
Exposure of a Silica-Containing Material in a Mach 0.3 Burner Rig



Oxide Contains Fe, Ni and O



Class 4

Category: Electron Microscopy – Scanning

A primarily silica material containing organic compounds, as well as trace aluminum and calcium impurities, was exposed to a Mach 0.3 burner rig using jet fuel at atmospheric pressure. The sample was exposed for 5 continuous hours at 1370 °C. Post exposure x-ray diffraction analyses indicate formation of cristobalite, quartz, NiO and Spinel ($Al(Ni)Cr_2O_4$). The rig hardware is composed of a nickel-base superalloy with traces of Fe. These elements are indicated in the energy dispersive spectroscopy (EDS) results. This material was studied as a candidate for high temperature aerospace applications.

EDS:

Spot 1: C, Ca, Fe, Ni, O, Si
Spot 2: C, Ca, Cr, Fe, Ni, O, Si
Spot 3: C, Fe, Ni, O
Spot 4: C, Fe, Ni, O

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